Starting with shot 73-040, the spot welds were augmented with a drop of silver paint.

E. Target Assembly

Target assembly involved bonding the silver specimen between sapphire anvil plates, potting the sandwich into a target holding ring, attaching electrical coaxial cables, and providing electrical shielding for the sample. Synthetic sapphire (single crystal Al_2O_3) discs 3.8 cm in diameter and 0.3 cm thick were purchased from Adolph Mellor Company. According to the supplier, the perpendiculars to the disc faces were oriented 50 to 90 degrees from the c-axis of the single crystals. Sapphire is hexagonal structure so that one might expect that shock-wave propagation would be anisotropic and mixed-mode. But it has been determined experimentally that shock waves propagate isotropically and in a pure longitudinal mode with an experimental error of ± 1% (Graham and Ingram, 1968). This is consistent with the experimental result that the elastic constants c_{11} and c_{33} happen to be of equal magnitude; its elastic response is symmetrical as a result.

The sapphire disc faces were parallel to within 2 to 10 μm. Faces were flat to within about 3 μm as observed with an optical flat and monochromatic light. As a check, the density of each sapphire disc was determined from weight measurements in air and water; the average value was 3.985 ± 0.005 g/cm^3. The backing piece had four 0.16 cm diameter holes for foil leads (Fig. 2b).

Assembly involved wetting all pieces (sapphire and foil) with vacuum-outgassed epoxy (Shell Epon Resin 815). Foil leads were bent over the edges of a glass microscope slide and then pulled through the holes in the sapphire backing piece. The slide was then removed, and the front sapphire disc placed over the foil. This assembly was placed on a flat plate and screw pressure applied to a small, Mylar-faced, aluminum block placed on the sapphire backing piece. Lead holes were cleaned of epoxy using toothpicks soaked in acetone. After two hours or more, the holes were filled with dental amalgam, which provided a better shock impedance match than epoxy for silver and sapphire. The sandwich was inspected after curing to verify that the foil lay flat and that there were no air bubbles near it. The assembled thickness of the sandwich was typically less than 3 μm thicker than the total thickness of the individual pieces. In 17 assemblies, the average increase in thickness was -0.5 ± 2.5 μm. The uncertainty is indicative of the accuracy of micrometer measurements. The sandwich was then potted inside a copper ring which in turn had been potted into a target holding-ring (Fig. 1). Next, a layer of aluminum was vacuum deposited on the target; this was done to provide a reflecting surface for optical alignment of the target on the end of the launching tube and to complete the electrical shielding with the copper ring and lid. Cables (RG-223/U) were attached and potted in place. Length of unshielded conductor from the plane of the foil to the coaxial cable was about 0.6 cm.